

The following reports were read and referred to the Publication Committee :

### REPORT OF THE PRESIDENT

*For the Year ending November 30, 1881.*

It is a pleasure to be able to repeat a statement made last year, that the Academy "remains free from debt," a very important statement, because the progress of the society is largely contingent on the condition of its financial affairs and the stability of its pecuniary resources.

The report of the Treasurer, William C. Henszey, whose prudent zeal in the discharge of the duties of his office entitles him to the full measure of our thanks, shows that the finances of the society are in a sound condition, and that the current receipts for the year somewhat exceed the expenditures.

The receipts from all sources amount to	\$6959.20
And the total disbursements to	6952.16
	<hr/>
Leaving a balance of	7.04

Even under this unusually favorable condition, observance of close economy in expenditures is still essential, as it ever should be under all circumstances, to keep the treasury always in a state to meet the current demands against it. They may possibly be greater on account of necessary repairs in the coming than in the past year. The exterior wood-work of the building may require painting in the course of the summer.

The treasurer's statements show that the Publication Fund, the Thomas B. Wilson Fund, the Elizabeth Phyle Stott Fund, the Isaac Barton Fund, the Charlotte M. Eckfeldt Fund, the Joshua T. Jeanes Fund, the Jessup Fund, the Life Membership Fund and the Maintenance Fund are in a satisfactory condition.

More than a thousand dollars of the income of the I. V. Williamson Library Fund have been necessarily diverted from library purposes to the payment of expenses to secure part of the property from which the income is derived. Now it is confidently believed that the whole of the receipts of the fund, which have been somewhat increased, may be appropriated to the purchase of books in accordance with the intention of its liberal and benevolent founder.

The manufacture of the *Proceedings and Journal* of the Academy has cost \$1307.92. The return to the treasury on account of their sale is \$1124.09. The works received into the library for them, in exchange, from 297 societies and 42 periodicals, at home and abroad, far exceed in value the difference between the cost of manufacture and the amount of money received on account of the sale of the Academy's publications.

The hope, entertained at the close of the last year, that the Maintenance Fund might be considerably increased by this time, has been disappointed. The circumstances which led to the effort to raise this fund have not changed. The enterprise has not yet been demonstrated to be hopeless, and until it is, should not be abandoned.

The aggregate of semi-annual contributions for the year reported by the treasurer, \$1936, suggests that it is desirable to augment the number of members.

Fees for admission to the museum amount to \$421.30, which is less than a janitor's salary.

Five students have been aided from the Jessup Fund in the course of the year. At this time two young men are its beneficiaries. The advantages of this fund are in demand. Many are indebted to it for a start on the course which led them to become naturalists and efficient investigators. An increase in the number of such scholarships is desirable. Every one who may give a sufficient sum to yield \$250 annually, to aid in the support of one student, will contribute substantially to the advancement of knowledge, and at the same time erect for himself a continuously speaking memorial, more enduring, and conspicuous than can be formed of monumental marble.

To encourage the study of natural history among young persons, the Agassiz Association of Natural History, a juvenile society, was granted, Dec. 14, 1880, the use of the library room on alternate Wednesday afternoons, for its stated meetings.

The use of the library room was given to a board of examiners of Harvard University, from June 30 to July 2, inclusive, for the examination of candidates for admission into that institution.

Permission to visit the museum, given to the teachers and a limited number of pupils of the public schools in 1879, has been extended to them through the year 1882.

The Legislature of the State did not accept the proposition of

the Academy to assume the custody of the collections of the Second Geological Survey of Pennsylvania and display them freely to the public, without any cost whatever to the treasury of the State. The proposition was approved in the Senate but not in the House. The result is not fortunate. It is believed that those collections cannot be held anywhere in the State more profitably to the public generally than in the Academy; because, located under the same roof with the collections of the First Geological Survey, with other extensive American and European collections, and also with a full and appropriate library of reference, they could be readily consulted and studied apart, or in connection comparatively with those of the First Geological Survey, as well as with other collections. No other place of deposit promises superior or equal facilities for their study.

The Curators report that the contents of the museum have been carefully inspected and that they are in good condition. Additions to the museum during the year not recorded in other reports are mentioned.

As long as the increase of the museum depends upon voluntary gifts alone, there is no reason to expect that it will ever be complete in any department, or as a whole represent the natural history of the day. Explorations of new regions and localities are continuously revealing objects, previously unknown, very few of which find their way into our cabinets.

To fill gaps which exist in many if not all the departments and make the museum perfect, money to purchase desiderata, when opportunity occurs, is necessary. A museum fund, yielding from twelve to fifteen hundred dollars a year, would enable the curators, in the course of a reasonably short time, to fill gaps in various departments and procure specimens of new objects whenever they may be discovered, and to furnish new materials for study and investigation. An endowment of this kind would do for the museum what the I. V. Williamson Library Fund has done for the library, which is regarded to be now the best and most extensive, though not yet complete, library of natural history of the United States.

The rate of growth of the library during the past year has been somewhat lessened, owing to a temporary diminution of the income applicable to it, as already mentioned. According to the report of the Librarian, 2719 additions to it from all sources have been

made. Reckoning ten pamphlets to the volume, he estimates that the library now contains 29,485 volumes, exclusive of duplicates.

Many of the works consist almost entirely of dry technical descriptions of objects, and are, in one respect at least, analogous to dictionaries or encyclopædias, which are referred to, but not read from beginning to end. As a rule, circulating libraries do not lend their dictionaries, nor recent numbers of periodicals and serials.

After ample experience and mature consideration of the subject in all its relations, the Academy determined that its library, like that of the British Museum, should be maintained as a library of reference only, under a conviction that the interests of students and of the members far and near would be, on the whole, promoted by this policy. A large proportion of the books have been contributed on condition that they shall not be loaned for use outside of the building on any pretense whatever. Even if the Academy were now disposed to change it to a circulating library, it cannot annul the conditions upon which most of the books were given and accepted, without breach of trust. It is not likely that a majority of those entitled to vote here will ever consent that the Academy shall merit the just odium of such action merely for the sake of loaning its books.

The Recording Secretary reports that twenty papers from twelve authors have been accepted for publication in the Proceedings; and that the fourth or concluding part of the eighth quarto volume of the Journal has been printed, and distributed to subscribers and to those on the exchange list.

The volume of Proceedings of 1881 contains about 500 pages. The third volume of a "Manual of Conchology," by George W. Tryon, Jr., illustrated by 628 figures given in 87 plates, with 310 octavo pages of text, has been issued from the Academy by the author; and the Rev. Dr. Henry C. McCook has had published by J. B. Lippincott & Co., an octavo volume, fully illustrated, on "The Honey Ants of the Garden of the gods, and the Occident Ants of the American Plains," much of which he had presented at stated meetings of the Academy in the course of the year.

Several papers from the Conchological, Botanical, Mineralogical and Geological Sections have been accepted for publication in the Proceedings of the Academy. The Entomological Section

has printed on the premises and issued about 230 octavo pages of its Proceedings and Transactions.

These publications constitute reliable evidence of the activity of the Society, as well as a measure of the extent of work done in connection with it by its members.

The average number of persons present at the stated meetings of the year is 30.44; the least number present at any meeting was 7, and the greatest, 363.

The scientific activity of the society may be estimated more accurately by what it publishes than by the numbers present at its stated meetings alone; provided its publication fund be equal to the demands made upon it. Original investigations are always pursued in the privacy of the study or laboratory. Discoveries, when made, are announced at a stated meeting, which is the avenue to publication, either in form of verbal communication or written statement carefully prepared for the Journal or the Proceedings. Such papers are read by title only: if read in full, technical or precise systematic descriptions of new species or genera would allure few not specially interested in their subjects, and a majority would find little or no pleasure in listening to them.

The progress of the society cannot be fairly inferred by comparing the average number present at stated meetings through a series of years. Careful examination of the minutes from 1850 to 1881, including both years, shows that the average number present at the stated meetings of each year does not increase regularly from year to year, but varies. The average attendance in 1850 was 12.28—little more than the average number present at the stated meetings of the Mineralogical and Geological Sections for 1881, namely, 11; for 1855, 19.26; for 1860, 35.55; for 1865, 18.28; for 1870, 22.34. Nor is there a uniform correspondence between the number of pages of Proceedings issued and the average number present at the stated meetings. A tabular statement of the average numbers in attendance at the stated meetings, the greatest and least number present at meetings in the year, the number of members and correspondents elected, and the number of pages of Proceedings published in the year, is herewith presented:

Year.	Average No. present at stated meet- ings.	No. present at any meeting.		Elected.		Proceedings published. Pages.
		Highest.	Lowest.	Members.	Corresp.	
1850	12.28	24	7	9	8	138
1855	19.26	33	6	21	13	200
1860	35.55	57	5	41	6	577
1865	18.26	34	6	25	11	310
1870	22.34	35	7	39	7	180
1871	20.15	36	8	35	6	370
1872	20.63	36	7	44	5	322
1873	24.73	41	6	48	9	470
1874	21.32	33	7	53	8	266
1875	25.94	50	11	52	10	552
1876	39.53	75	7	47	15	440
1877	31.55	78	9	43	66	403
1878	31.51	107	9	28	32	475
1879	36.71	190	13	23	8	490
1880	27.26	113	5	26	20	457
1881	29.80	363	7	15	6	

An estimate of the activity of the Academy from the numbers in attendance at its meetings alone, should include those in attendance at the meetings of the several sections. To specialize is the order of the day. All the great meetings of men interested in the advancement of the different departments of knowledge are splitting into sections and special societies. Many who habitually attend the meetings of the sections are seldom present at the stated meetings of the Academy, but their presence and work in the sections make part of the common or general activity of the society.

The Department of Recent Conchology now contains 139,592 specimens, mounted and arranged in 39,501 trays. The species are named throughout, and all, with rare exceptions, are accessible to students. The space allotted to this branch of natural history in the museum is insufficient. Lack of room for the Mineralogical and Geological Cabinets is also manifest.

Extension and completion of the building is very desirable. At this time, the building fund amounts to \$3689.20. Attention of members and friends of the Academy is respectfully invited to this important matter. The finished part of the building is not now large enough to properly arrange all the materials in it in the most convenient manner for their study, and is certainly not sufficiently extensive to display them to the public in a way to



render them attractive and instructive to visitors in general. The present rate of growth of the museum and library, and the already crowded condition of the cases, suggest that ways and means should be devised without delay to augment the building fund. It is obvious that a vast museum and a great library connected with it demand space for their accommodation commensurate with their extent; and that a structure to embrace such space cannot be erected in a day, at any time, nor without a large sum. To raise sufficient money to complete the edifice designed for the purposes of the Academy will be found an arduous and slowly progressive enterprise. Therefore no date will be too early for its commencement; its success will not be too soon. And for this the Academy must, as heretofore, rely upon the generosity of the intelligent and public-spirited who believe with us that the cultivation of the natural sciences is in many ways advantageous to the public; and that the project of completing the building and expanding the museum of the Academy, till it shall be in every sense a perfect museum of natural history, is worthy of favorable consideration and prompt encouragement.

Such an establishment would be an addition to the positive attractions of Philadelphia, and thus become indirectly of commercial value to the city; especially if admission to it during a part of every secular day were without fee, and monitors were always at hand ready to explain to visitors the nature of the objects displayed. It would be among the best of charities, for it would help all to knowledge who are disposed to help themselves. A leisurely promenade through a complete and well-arranged museum of natural history, where questions of curious and inquisitive visitors might be answered on the spot, would be almost in itself an education in this connection.

To hope for such a museum here is extravagant only in view of the great expense. The chief obstacle in the way of its realization is the cost, which would possibly far exceed that of a free public library of general literature, or a free public gallery of fine paintings. A museum of natural objects might not be as alluring to the masses as fictions told in prose or verse, or in different-colored pigments deftly mingled and displayed, all exciting admiration, and more likely to arouse romantic, even sensuous notions than to convey a ray of truth of any sort to the mind of the uncultured observer. But the influence of the museum in

teaching untrained minds to think rightly and appreciate the beauties of truth, everywhere manifest in the works of the Creator, is likely to be as great, if not greater, and certainly not less salutary.

A complete standard museum, free to the public, is surely desirable in a locality which contains more than a million of inhabitants within a radius of ten or fifteen miles from this centre. The city contains many private special collections, and several small, good museums connected with colleges and schools, which are accessible to the few, but there is no great museum of natural history absolutely free to all. Without lessening the importance and value of private or collegiate collections, and without interfering with students in their use of it, the museum of the Academy, which has been formed at the cost of many years' labor and much money, can be made in a short time complete and entirely free to the public, provided that sufficient means for the purpose are supplied. Herein lies the difficulty of the problem to be solved before starting the enterprise suggested.

A newspaper has recently said that among our opulent citizens are those who might, without inconvenience, give a million to found a free public library. Assuming the conjecture to be true in part, at least, it might not be entirely in vain perhaps, to invite those very wealthy and intelligent persons to consider the claims of the Academy on their bounty.

The annual reports of the several sections or departments of the Academy show that their condition is satisfactory. They are:

1. The Biological and Microscopical Section, founded in 1858 by the absorption or junction of the Biological Society, then recently organized, and by adding to it, in July, 1868, the then newly formed Microscopical Society.

2. The Conchological Section, founded December 26, 1866.

3. The Entomological Section, founded November 1875, chiefly by annexation of the American Entomological Society.

4. The Botanical Section, founded in June, 1876.

5. The Mineralogical and Geological Section, founded April 24, 1877, under the title of Mineralogical Section. Its present title was authorized November, 1879.

The Biological and Microscopical Section reports that Professor J. Gibbons Hunt delivered seven lectures on histological subjects before the Section during the year, and that its annual exhibition



was held on the evenings of November 16 and 17. It was largely attended by members of the Academy and their friends, and was satisfactory to all those who took part in it.

The sections afford greater facilities to specialists in their pursuits than they could obtain in newly organized and independent societies. They are in no sense detrimental to the interests of the Academy. They have the immediate care of those departments of the museum which are appropriate to them; and in this connection their conservators relieve the Curators of considerable labor. There is no apparent reason why the formation of sections should not be encouraged. They tend to unite those engaged in separate but closely allied studies, advantageously to them as well as to scientific progress, and to centralize their interest in the general welfare of the society. A desire of membership in a section is often the only inducement to seek membership in the Academy.

The by-law, enacted May, 1876, which provides for the establishment of Professorships, had remained almost inoperative until December, 1880. In its partial observance it promises to be satisfactorily efficient, at least for the present.

The enactment was founded on an idea that "there are many men eminently qualified in all respects to engage in original research whose scientific work is greatly restricted because almost all their time is necessarily spent in gaining a livelihood, who, like the Davys, Faradays, Huxleys, and Tyndalls of the Royal Institution, would gladly accept a moderate support of assured continuance, and in return for it devote all their energies to scientific investigations and teaching."

Objection to the scheme, though commendable in itself, was that "to appoint professors before providing a laboratory in which they may pursue their investigations, or a lecture-room for the accommodation of those who would listen to their teachings; or means for their permanent and entire support, would be merely to bestow complimentary titles, without advancing the interests of original research in any manner or degree. Gentlemen elected to professorships without income would not find in the title of professor alone the means of living. Such title would not relieve them from the necessity of giving their time and labor to some exacting vocation for daily bread, nor afford them more leisure than they may possess without it. Those devoted to original investigation who are pecuniarily independent of secular employment do not need

the assistance which hoped-for endowments are designed to give. As the library and museum are accessible to all for the purpose of study, they are in condition to pursue their scientific labors without acquiring the title of professor from the Academy."

If the enactment be founded as stated, the objection to the appointment of professors before making provision of facilities suitable to the work imposed upon them, and of sufficient means for their permanent support, has no less force now than when first made five years ago.

It has been considered expedient to inaugurate the scheme of professorships before providing the ways and means for their permanent support, in the hope that the effort may meet with substantial encouragement.

Dr. J. Gibbons Hunt was duly elected Professor of Histology and Microscopic Technology, April 17, 1877, without compensation or authority to incur expense.

At a stated meeting of the Council, December 27, 1880, Mr. Angelo Heilprin was duly elected Professor of Invertebrate Palæontology; and January 24, 1881, Mr. Henry Carvill Lewis was appointed Professor of Mineralogy.

Knowing that the society has no means to defray any expense incidental to the professorships, and that the long wished-for endowments to support them have not yet been made, these gentlemen have generously volunteered to contribute their time and valuable services towards promoting the interests of the Academy and scientific advancement without pecuniary compensation.

The Committee on Instruction and Lectures made arrangements necessary to enable the professors to inaugurate the work of instruction. Professor Heilprin delivered a lecture introductory to his course on Invertebrate Palæontology before the Academy, March 6; and at the stated meeting of the 15th, Professor Lewis delivered an introductory lecture to his course on Mineralogy.

The average attendance at Professor Heilprin's course of twenty-six lectures was twenty-five, and at Professor Lewis' course of fourteen lectures, thirty-five.

The Rev. Dr. Henry C. McCook, Chairman of the Committee on Instruction and Lectures, said, in his report, May 31, 1881: "The committee feels pleasure in recognizing the valuable services rendered by the professors to the classes of last winter—service that has been none the less valuable and is all the more entitled

to hearty acknowledgment because voluntarily given. It has not been possible to give them a pecuniary acknowledgment of their services worthy of any notice in a report. The hope is expressed, that the liberality and justice of those interested in this department of the Academy's work, will enable the committee to make a more favorable report in this respect upon the operations of next winter."<sup>1</sup>

The committee has announced that early in January, 1882, Professor Lewis will begin a course of 25 lectures on Mineralogy, and Professor Heilprin a course of from 25 to 30 lectures on Invertebrate Palæontology.

The institution of these lectures is based on a supposition, a conjecture that there are many persons in the community who desire to be systematically taught such branches as are not included in academic or college courses, or if included, not generally accessible to those who are interested only in subjects proposed to be taught here, and that those persons are in number sufficient to warrant and sustain the enterprise. Experience will be required to determine whether or not the conjecture is well-founded, because the nature and character of the instruction given here is not likely to be generally known or appreciated in the community in a trial of less than two or three years. If, at the end of a third course, it should be found that the number attracted to these courses is not large enough to compensate the professors, it is not reasonable to suppose that they will be willing to continue their labors, which are certainly very considerable, without adequate substantial remuneration. When it becomes manifest that the demand for systematic and practical instruction is not sufficient to warrant or encourage work of this kind, it will be suspended. Then the professors will be free to devote their time to original investigations exclusively, provided that means of livelihood are supplied by endowment or otherwise.

On the other hand, if the admission fees are sufficient to maintain the lectures and lecturers, other systematic courses of instruction will probably be undertaken and continued as long as they are supported, and thus the Academy, which has been heretofore mainly a repertory of means and resources for the use of those who seek to instruct themselves, may also become efficient in

<sup>1</sup> The total amount of fees for admission to the lectures was \$151, and of the incidental expenses, \$52.27

teaching all branches of natural history, both by lectures, appropriately illustrated by diagrams and by specimens from the museum as well as by personal, individual laboratory work under the supervision of the professors.

Whatever the result of the experiment in teaching may be, the appliances necessary to study possessed by the Academy, will be always accessible to those who may be gratified to have an opportunity to teach themselves—to be self-taught.

Although defective and deficient in some respects, there is no conclusive reason to suppose that the Academy is not now realizing the hope of its founders, as well and as surely as in any previous year of its history. That defects will be corrected and deficiencies supplied in the course of time may be confidently conjectured, because the needs of students of natural science, which is daily becoming more fully appreciated than ever before in the world, are better understood. A great library and extensive collections of natural objects, appropriately classified and labeled, are necessary to enable the student to become a master of natural history, and qualify him to be a successful investigator. The cost of such necessary appliances and facilities of study is so great that no one student is able to purchase them for himself alone. He can enjoy their use, therefore, only in common with others, in a society like the Academy, which has acquired them through the generosity of many individuals in the course of years. Every specimen, every book, every dollar given here is a contribution to the repertory of means to facilitate the labors of present and future students of natural science. And every contributor is regarded as a benefactor to them directly, and indirectly as a patron of scientific progress, in greater or less degree.

Since the Academy was in its embryo state, seventy years ago, public opinion of the character and influence of its pursuits has greatly changed. Then they interested comparatively few, and those few were supposed to be almost, if not entirely, free from the influence of belief in religious principles of any kind. Many pious but prejudiced persons imagined that a naturalist is necessarily an infidel. Those very good, ignorant people then, like multitudes of the same class of the present day, limited their study of animal creation almost exclusively to man and his actions, depicted in endless variety by prose-writers and poets. Assurance that there is equal pleasure and greater mental satisfaction in the study of

organisms inferior to man, fell then as now, generally speaking, upon incredulous ears. They do not believe them worthy of serious attention.

The nameless author of "*La Spectacle de la Nature*," a work which has the censor's approval, dated Paris, March 20, 1732, speaking of insects, says: "If the Deity did not think it unworthy of Himself to create them, is it beneath us to consider them? \* \* \* the minutest things in nature were appointed to some peculiar end and purpose, and the Deity is as conspicuous in the structure of the fly's paw as He is in the bright globe of the sun himself."

No one pretends now to impugn the truth of this ancient statement!

But the study of the natural sciences is no longer regarded among Christian theologians and laymen of intelligence to be antagonistic to the existence and growth of religious sentiment. Statesmen recognize in it economic value. Governments require naturalists to accompany all geographical explorations. United States and State Geologist, Botanist, Entomologist, etc., are familiar titles. Periodical publications devoted to the natural sciences are numerous. To this kind of evidence of the increasing popularity of scientific pursuits may be added the multiplication of societies for their promotion in different parts of the country. All of them have been formed since the Academy was founded. They are all welcome co-laborers in the vast field of work, and are not regarded in any sense as rivals or competitors. They serve to create a spirit of wholesome emulation.

It is pleasant to suppose that the Academy has had a salutary influence on the progress of the natural sciences to the degree of popular favor they now possess, and that its general conduct heretofore is approved. Its ways have been and are unpretentious, unobtrusive. Membership in itself is not significant of any degree of scientific acquirement, but only of friendliness to scientific pursuits. Candidates to be inscribed on the list of its members are not required to possess special qualifications. Those members who avail themselves of the opportunity and appliances afforded to study, gain knowledge and receive due credit for any good work they may do. The reputation they may thus acquire is reflected upon the Academy.

On its list of members are very many who manifest their



interest in the society's welfare only by contributing to its funds or collections ; many who are active and successful workers ; many who are distinguished by their attainments, and some who have reached great eminence ; and it is reasonably supposable that recruits are coming forward to fill vacancies as they occur in each of these different kinds or classes of members. It has many numerous and valuable collections in every department, some of them unsurpassed, which are continuously increasing ; and an appropriate library, the best of the kind in the country, for the steady growth of which permanent provision has been made. It owns the building it occupies, with land enough on which to expand it to twice its present dimensions. It is free from debt, and its current income has been in the past year equal to its economical expenditure.

The condition of the society, attained at the end of seventy years' existence, without any pecuniary aid whatever from the government of the State, justifies the policy which has guided the management of its affairs. There is nothing in its past history to suggest that it should depart now from the general conservative policy which has characterized almost every step of its progress since 1812. Observance of this policy has brought it to its present condition, in which there is nothing to warrant foreboding of decadence, but much on which to found hope of continuous progress. This condition is satisfactory, because at this time the income is enough to meet all unavoidable expenses. Suggested improvements in several directions are very desirable and earnestly hoped for ; but they are of such a character that they can wait until money is supplied for their realization without absolutely arresting the progress of the institution.

Respectfully submitted.

W. S. W. RUSCHENBERGER.

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## REPORT OF THE RECORDING SECRETARY.

The Recording Secretary respectfully reports that during the year ending Nov. 30, 1881, fifteen members and six correspondents have been elected.

Resignations of membership have been received from Messrs. J. Ward Atwood, H. Dumont Wagner, E. Egglesfield Griffith, Henry Pemberton, Jr., and Wm. F. Sellers.